United States Department of Agriculture

Economic Research Service in Transition

The work described here is the agency's current thinking on what will receive continued or new emphasis in the immediate future. The ERS program is dynamic; plans change as new conditions and problems emerge. Consequently, the ERS statement on areas of emphasis will be reviewed and reissued periodically, depending upon perceived need.

Suggestions and comments regarding the ERS program and areas of emphasis are welcome at all times. The agency seeks broad review from the research community, users and other groups, and individuals. Agency staff are prepared to lead discussions on its plans. Please address your suggestions and inquiries regarding ERS program emphasis to: Administrator, Economic Research Service, USDA, Washington, D.C. 20250.

Washington, D.C. 20250

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FOREWORD

The Economic Research Service has unique opportunities and tremendous potential. I believe that the potential benefits of doing our job well have never been greater.

U.S. agriculture and rural America have gone through changes of unprecedented magnitude since World War II. Agricultural markets have been internationalized. Environmental issues have emerged. Rural America is no longer primarily agrarian. Farms are fewer, but larger. They use high technology and much capital. Most are still sole proprietorships.

These and related institutional, economic, and technological changes raise questions about the alternative roles of and need for public actions related to agriculture, natural resources, and rural America. What are the effects on consumers and society as a whole? And, how are those who provide labor, capital, land, and management to produce goods and services in rural America affected by economic and social conditions and policies and programs?

Providing answers to these kinds of questions—indeed for assuring that the important questions are asked—is a primary reason for ERS's existence. While ERS has to be many things to many people, it cannot be all things to all people. Our resources are finite. The number of researchable problems that could be addressed far exceeds what can be done. Thus, it is necessary to ask, "What are the priorities for the Economic Research Service as a Federal agency?"

This document focuses on the mission and responsibilities of ERS. It appraises the emerging setting for U.S. agriculture and rural America in the years ahead. In these contexts, priority researchable problems and thrusts for the rest of the decade are identified.

Much of the work we describe here has started, some is being planned, and some represents research areas yet to be developed. No attempt is made to put the problems and the thrusts in priority order. All are sufficiently important to sound public policy that they must be addressed by the agency. ERS may be justified in seeking new funds for some of the activities, but we expect to make significant contributions within our existing resource base.

Communication about the prospective focus of the ERS work is important. Continued dialogue among the research and management staff of ERS is part of the communication, as is dialogue with others, including: (1) those in the other institutions that also have research, analytical, and outlook responsibilities and (2) those who use the products of these efforts. Such dialogue enhances the effectiveness of our priority setting and the usefulness of our work. Furthur, such interaction helps identify ways that ERS and others can collaborate. Therefore, comments and reactions to the ideas and priorities set forth in this document are welcome.

JOHN E. LEE, JR.
Administrator

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MISSION AND PERSPECTIVE FOR THE ECONOMIC RESEARCH SERVICE

The Economic Research Service reports to the Assistant Secretary for Economics within the U.S. Department of Agriculture. ERS has leadership within the Department to provide economic and social science information useful for improved understanding of and solutions to problems and issues facing producers, input suppliers, processors, distributors, and consumers of agricultural products, users of natural resources, and rural residents and public officials. ERS uses the disciplines of economics, sociology, and other social sciences to develop objective information for the public, policymakers, and managers of programs. ERS programs provide an economic and social science information base to enhance the quality of decisions related to (1) private production, marketing, consumption, and resource use activities, and (2) policies and programs of government.

ERS Responsibilities

ERS has four major responsibilities. All require a solid base of expertise, economic data, and tools for applying the expertise and data.

- *Analyze the current situation and outlook.* That includes our traditional situation and outlook reporting, which must be sufficiently analytical to explain the forces influencing the current situation and prospects. Outlook includes forecasting a year or two ahead and projecting 5 and 10 years (and occasionally longer). The purpose is to provide understanding of alternative scenarios for the future, the interaction of economic forces and assumptions that make up those scenarios, and how those forces and scenarios would affect the outcomes of different public policies and private investment decisions.

- *Put current issues and concerns into social and economic perspective.* Too often, a perceived problem may only be a manifestation of more fundamental underlying problems. Issues such as soil erosion, rural poverty and employment, returns to farming investments, agricultural credit, linkage to world markets, and the changing structure of agriculture are very important. ERS's job is to provide the information that puts these issues, among many others, into clearer perspective to facilitate more informed policy responses to underlying causes of problems and issues.

- *Examine how well agriculture and rural institutions perform and how their performance is affected by public policies.* That work must be the heart of the research program if ERS products are to be useful to those who make and carry out policies.

- *Draw on all the above activities and capacities to do the staff work necessary for the decisionmaking process.* Staff work ranges from providing quick turnaround responses to doing studies that may take a year or longer. Such work is highly demanding professionally and requires command of economic and related social science theories and proficiency in applying a wide range of analytic tools. Staff work, especially, requires good communications skills.

ERS Focus

The central focus of ERS analysis is on the performance of the U.S. and global food and fiber system. Performance of the food, agricultural, rural community, rural labor, and natural resource systems is based on society's goals for these sectors. These goals include: an economically healthy and viable agricultural production and marketing system, prudent and efficient use of natural resources, affordable high-quality food for the entire population, and an adequate and equitable economic well-being and quality of life for all citizens regardless of rural or urban residence. The primary performance and effectiveness measures in ERS analyses are:

- Efficiency measures (broadly defined) to examine the relationships of economic and institutional inputs to the value of outputs: how do costs per unit of output change; how can the sector's resources be most effectively used to achieve public policy objectives?
- Distributive measures to examine the relationship of economic and institutional factors to the allocation of benefits and costs: to whom are the benefits, costs, and externalities distributed?

- Qualitative measures to examine the relationship of economic and institutional factors to the nature and acceptability of the output: how does the quality of the product, service, resource, or living environment affect the interests of producers and others?

These measures are not mutually exclusive. Often they are highly interrelated. Efficiency studies have received most attention. However, qualitative and distributive questions have become increasingly important in ERS work.

The substantive focus of ERS research and analysis is fourfold:

- The U.S. food and fiber production, marketing, and distribution system.
- International agricultural trade and development.
- Natural resources and environmental quality in relation to food and fiber production.
- Rural human and community resources.

Where ERS Fits

An important dimension of the mission and focus concerns the organizational location of the agency. ERS is the only sizable body of publicly employed economic and social scientists at the national level focusing on food, agricultural, resource, and rural issues. Furthermore, ERS is deliberately separate from and not subsumed under USDA agencies responsible for administration of specific programs. Within USDA, ERS is responsible for addressing broad aggregate issues pertinent to the national public policy process, and ERS responds to the need for information and analyses relating to a wide range of issues. The agency has considerable latitude to choose priorities and address questions about how the public interests are being served. A challenge to the agency is to anticipate emerging public issues and be prepared to address them.

ERS cooperates with other research and statistics organizations in areas of mutual interest. The ERS focus is on broad public policy issues. Hence, an important area of common interest with universities and other research organizations concerns aggregate studies supporting analyses and data bases, including analyses of national and international policy and institutional issues. ERS encourages work by others in these areas and, where possible, organizes and coordinates its activities with cooperating institutions. ERS also relies on the total knowledge base generated in universities and other research and statistical institutions as a part of the professional capital necessary to do its job.

Form and Scope of ERS Output

ERS output takes many forms, ranging from the compilation and release of basic data to the publication of comprehensive analytic reports. The manner and form of transmission depend upon the clientele and need. The primary mode is through written reports that fall into several official publication series. A significant part of the ERS output is in the form of periodic reports containing data and outlook information. Electronic media are becoming increasingly important in the transfer of ERS information. Part of the output is in the form of staff reports and memos for the executive branch and Congress. An important part is also provided orally in committee settings and in other personal contacts. ERS personnel also report their work in a wide array of professional journals, popular magazines, and newspapers, as well as television and radio.

ERS Clientele

ERS information serves two broad clientele groups concerned with food, agricultural, resource, and rural issues. One group includes policymakers and program managers—members of the executive and legislative branches of Federal, State, and local governments—who are involved in making public decisions that influence the performance of agriculture, natural resources, and rural America. The other group is the public at large—farmers, consumers, business people, and individual citizens who bring their interests to bear on the public policy process and who make private decisions that affect the performance of the system or sector in question.

A client relationship also exists with other research and data organizations. Researchers and analysts throughout the United States and the world depend upon ERS periodic reports and data series. And ERS depends on other agencies and groups for much of the base data used in its analyses.

Criteria for ERS Priorities

The national mission and the policy focus provide criteria for establishing ERS priorities. In matters of organization and identifying major thrusts for ERS, the following general guidelines are considered:

- Studies of broad national significance or about which there is broad public concern take precedence over more limited-interest issues.

- Information that aids decisionmakers to improve the overall performance of the agricultural, rural and/or resource sector, system, or market in question is of higher priority than that which serves more specialized interests.
- Research activities that support the achievement of the basic goals of public policies and enhance the formulation and administration of effective national policies and programs are given priority over issues not directly associated with Federal and departmental responsibilities.
- Analyses of issues important for the public interest but which are not being addressed by other public or private research institutions are given priority over studies addressed by such institutions.

These guidelines or selection criteria imply a broad aggregate perspective that depends on macro and micro data and analysis. However, micro studies are limited to those that help improve the understanding of economic and social behavior as well as qualitative and distributive impacts relevant to national issues.

THE SETTING FOR ERS RESEARCH IN THE 1980's

The economic and social setting of the 1980's is important to the direction of ERS research. Information and analysis of current conditions and emerging global and domestic trends affecting agriculture will be needed for effective public decisionmaking. Of particular importance for ERS research programs is the closer integration of agriculture with the domestic and global economies, the continuing importance of agricultural trade, concerns about efficiency of natural resource use, the quality of the environment, and the changing nature of rural communities and the rural labor force.

Many forces currently at play will certainly be important over the next decade or two. Here are five that are expected to have considerable influence on the ERS agenda:

- Agriculture's linkages to the world economy.
- Agriculture's transformation in the domestic economy.
- Technology's influence on productivity and resource use.
- Rural America's need for social and economic development.
- Increased complexity of agricultural and resource policymaking.

Agriculture's Linkage to the World Economy

Since the 1970's, production from as much as 40 percent of U.S. cropland harvested has been exported, and exports have accounted for as much as 25 percent of cash receipts. Exports generate employment and incomes in agriculture, in processing and marketing, in rural communities, and throughout the economy.

Agricultural exports boomed in the 1970's, then fell in the early 1980's, illustrating the vulnerability of the U.S. agricultural economy to external supply and demand conditions and policy developments. Agricultural exports contribute to a positive agricultural balance of trade which has averaged around $20 billion during recent years. This surplus helps pay for imports of petroleum, other commodities, and consumer goods. The United States is also a major importer of agricultural commodities, buying around $16 billion annually since the mid-1970's. Many of these imports are tropical products from developing countries whose imports of food and feed grains are increasing. Such complementarity is in contrast to the increasingly competitive agricultural trade between the United States and developed countries.

U.S. agriculture is thus strongly influenced by world developments. Weather has always affected U.S. production. Now, weather elsewhere can seriously affect the demand for U.S. agricultural products. In addition, agricultural and trade policies of other countries have become increasingly important. Recent trade policy conflicts between the United States and the European Community and Japan are examples.

World macroeconomic developments and monetary policies also have an increasing impact. Such global variables as population growth, economic growth, distribution and composition of income, inflation, exchange rates, interest rates, credit policies, oil and other commodity prices, technology, and institutional changes will undoubtedly continue to influence U.S. agriculture. Similarly, U.S. agricultural and economic policies can significantly affect world agricultural and economic activity.

Economic conditions in the low- and middle-income countries affect U.S. agricultural trade. Growth in demand for food will outstrip growth in food production in many of these countries during the next several decades. The resulting gap will need to be made up either by commercial or concessional imports. Economic growth and agricultural development in these countries are thus important to U.S. agricultural interests.

Economic growth and the capacity to expand commercial trade often rely on successful agricultural development. Conversely, the lack of economic growth contributes to the need for concessional imports. Poverty and inadequate food consumption and, in some cases, malnutrition persist even in some middle- and high-income developing countries. As a result, food security (the provision of an assured supply of adequate and nutritious foods) remains a critical concern for many in the developing world. These same developing countries are the largest potential growth markets for U.S. agricultural commodities.

Agriculture's Transformation in the Domestic Economy

As the U.S. economy has changed, so has its agriculture. A prominent feature is the substitution of capital goods incorporating new and different technologies for the traditional inputs of land and labor. Agriculture has evolved from an essentially self-contained sector to one characterized by a high degree of capitalization and the use of purchased inputs. Because of agriculture's interdependence with the rest of the economy and its increased reliance on debt financing and purchased inputs, its financial health is expected to become increasingly dependent on interest rates and general business conditions. Monetary policies and economic activity affect the availability and cost of credit, cost of production, and asset values in agriculture. Rates of return on agricultural investments, income level and stability, equity, and sector growth among others are directly influenced by macroeconomic developments.

In turn, the economic activity generated by farm products as they pass through the economic system accounts for about one-fifth of the Nation's gross national product, making agriculture America's largest industry and employer. The overall economy, consequently, is highly dependent on a healthy agriculture.

The number of farms, a primary indicator of the agricultural transformation, declined rapidly in the past 50 years, but the decline has recently slowed. The average size of the remaining farms has increased rapidly. More nonfarm resources have gone into farming and their productivity has increased. The volatile energy situation injects substantial uncertainties into U.S. farming. Increasing input costs affect the mix of resources used in farming. Economic incentives exist to use energy- and labor-efficient systems of production.

Distribution of income among farm people has changed because of several forces such as: (1) availability of capital goods incorporating new and different technologies, (2) commodity programs supporting farm

prices, (3) programs providing credit for purchase of farm real estate and capital goods, (4) continued emphasis on farm exports, (5) nonfarm jobs for people not fully employed in farming, and (6) the interactions of tax and credit policies and periodic inflation.

Production is becoming concentrated among the large producers, with 49 percent of output coming from only 5 percent of the farms. While more land is being farmed by renters, owner-operated farms continue to prevail. The preliminary 1982 Census of Agriculture indicates that the number of farms over 2,000 acres in size increased by only about 1,200 since 1978. At the same time, the number of farms under 50 acres in size, increased by nearly 100,000 over this same period. Net incomes from farming vary widely across the various sizes of farms. Net farm income now comprises less than half of the family income of the farming sector. Farm income has been consistently negative for the smaller sales classes since the late 1960's. And, off-farm income has become increasingly important to these farmers. These trends likely will continue.

The link between farming and the subsequent stages of the food system is growing ever more complex. Initial buyers of farm products are fewer and larger. This increased concentration has led to many changes, including the greater use of contracts with farmers and prearranged pricing procedures. Some small producers may have problems obtaining inputs and accessing markets.

Food manufacturing and distribution industries have also become more concentrated. The 100 largest food manufacturers controlled 74 percent of all food manufacturing assets in 1978, compared with 36 percent in 1950. Similarly, the 50 largest grocery-retailing firms accounted for 44 percent of all national sales in 1977, up from 27 percent in 1940. Increased concentration has led to the dominance of national and, in some instances, multinational food processors and supermarket chains. In addition, several major food-processing firms are now divisions of conglomerate businesses. The level of concentration raises questions about the performance of the marketing sector in terms of efficiency and food costs. The agricultural production sector increasingly is the source of raw materials for a food system dominated by processing, distribution, and marketing firms.

Technology's Influence on Productivity and Resource Use

Technology is considered by some to be the single most important driving force in the evolution of agriculture. Technology development and

adoption determine the possibilities for the organization of agricultural production. Such developments could determine the control and coordination structure within agriculture and the interrelationships between agriculture and other sectors. Technology shapes production patterns, input use, and competitiveness. One technology that will certainly have profound impacts on farming is the improved electronic information technology, affecting how farmers plan, manage, produce, and market. The collection and dissemination of statistics in economic analysis will be affected in major ways. Information technology will beget management technology. Farmers may be able to manage more resources and do it better, probably reducing the managerial costs of existing output levels. Biotechnology is another area expected to have significant impacts on agriculture.

Some perceive the adequacy of the resource base for agriculture to be a pressing issue, especially if capital input substitution slows. The quantity and quality of the natural resource base for agriculture have become national policy issues in recent years. Agricultural and nonagricultural activities are competing for land and water resources in many rural areas. Ground water depletion is a major concern. Soil erosion continues to diminish agricultural capacity and contribute to water quality degradation in many rural areas. In other areas, contamination of ground and surface waters by excess salinity and toxic residuals from agricultural and industrial processes is a growing problem. The area affected by airborne pollutants has expanded dramatically in recent years and now covers most of the Northeastern United States and Eastern Canada. Public concerns about food quality, personal health, and the maintenance of a quality living environment will increasingly impinge on agricultural decisionmaking.

The productivity of agricultural land and water resources depends on the decisions of individual land managers and the technology used in farming operations. Authority to regulate land and water use is generally reserved to the States and localities, although Federal policies and programs also affect the stewardship of natural resources. Federal programs and policies, while indirect in their influence on agricultural land and water use, nevertheless significantly influence farmer decisions regarding use and management of natural resources.

Questions of long-term agricultural supply response involve intricate relationships among farmers' attitudes and behavior, tenure arrangements, policies and regulations, and trends in technology and environmental effects. Land values and the ownership patterns of agricultural land affect the productive capacity of land and influence the resulting

distribution of wealth and income. These factors are becoming more important in the assessments of the effects of alternative commodity, farmland preservation, soil conservation, and other natural resource policies and programs.

Increasingly diverse economic activity in rural America introduces uncertainty into the availability and quality of natural resources for agriculture. Other pressing concerns in today's developing rural America are the effects of environmental regulations on agricultural productivity, the influence of agricultural activities on resource quality and quantity, the effects of agricultural production on the quality of life in rural (and urban) communities, and constraints on agricultural production from urban pursuits.

Rural Needs for Economic Development

For more than 20 years, policies were developed as a response to conditions of rural exodus and economic stagnation. However, changes in the economic and social character of rural America, culminating in renewed population growth in nonmetropolitan areas during the 1970's, have altered the setting for future policy.

While population growth is the most visible sign of change, recent experience in rural areas encompasses more than that. Equally important are the growth of nontraditional industries and the growth in the size and complexity of rural government and other institutions. The strength of the underlying forces shaping development, including economic decentralization, modernization of rural life, and preferences for rural living, point to further growth during the remainder of the century.

Rural incomes have come closer to urban incomes in recent decades, but rural regions continue to have a disproportionate share of poverty. Most of the Nation's consistently poor regions are rural. The poor in rural America generally are less educated, have few marketable vocational skills, and have a high rate of work-limiting disability. Moreover, they live typically in communities that chronically invest little in human and community resources. Hence, rural poverty will still be of high public concern during the next decade.

Rural employment has become more diverse and less agricultural in recent decades. By 1979, the most inclusive definition of agricultural workers (wage and salary, self-employed, unpaid family) included only 3.4 percent of the U.S. workforce. In nonmetropolitan areas, the percentage

of employment in agriculture declined from almost 14 percent in 1950 to 8 percent in 1979. In contrast, manufacturing accounts for nearly one-fourth of all nonmetro employment, trade and government one-sixth each, and services one-ninth. However, individual rural economies are sufficiently small that this process of development has not led to a broad-based employment mix in particular communities.

These changes in rural America have direct implications for financing and delivering public and private services, for adequacy of physical facilities, and for the capacity of governing institutions. Moreover, these changes affect agricultural production, land and water use, business and commercial activity, housing and housing-related services and facilities, and social relations. Adjustment is not simple or automatic. And, rural-urban definitions no longer provide a useful dichotomy for rural policy and program administration. Recognition of the trend toward diversity within rural regions is essential for effective adaptation to change.

Agricultural and Related Policy Needs

There is a growing awareness that American agriculture has changed. Large commercial farms dominate U.S. farm production. The operators of the remaining smaller farms generally are not poor, do not depend solely on farm income, and do not benefit much from traditional commodity programs. These factors could change the public's perception about agriculture and affect the public's view and support of farm programs that essentially result in transfer payments. Many of the commercial farms can be competitive in world markets, but may be hindered by present policies. Additional questions can be expected about the objectives of farm programs and who benefits from these programs.

Demand for U.S. agricultural products in the rest of the 1980's is unlikely to be strong enough to take the slack out of production capacity at prices near or above recent support levels. There is also growing awareness of the importance of price in world markets. How the body politic chooses to reconcile this issue is critical to the character of U.S. agriculture in the rest of this century. These choices will determine not only price levels, but how they are set and who will produce and where.

There is growing interest in assuring that commodity, credit, and resource policies are not working against each other. This consistency, however, may impose some new constraints (and costs) on farmers, such as requiring adoption of conservation practices and limits on subsidized credit. Any commodity policy that supports wise use of the Nation's land

and water resources should recognize the importance of market forces. The constant changing of programs is a major source of uncertainty and inefficiency.

There is growing awareness that domestic farm policy and trade policies are closely related. Further, domestic farm policy and resource and environmental policies are becoming more closely linked. Agricultural programs may influence the long-term use, availability, and productivity of soil and water resources. Also, production inputs may affect the safety of products and influence the quality of resources for those who use them directly. Agricultural production also is influenced by industrial pollution, such as acid rain. Thus, lawmakers are becoming sensitive to the multiple interests, their implications, and linkages of domestic policy tools.

An emerging issue facing agriculture is production variability. Recent studies suggest that the variability in agricultural productivity has increased substantially in the last decade. Is it the result of changes in weather patterns, shifts of production to marginal lands, less dependence on more stable animal agriculture, or more reliance on a high-technology agriculture? What are the costs and benefits of policies to temper the effect of these destabilizing forces?

Lawmakers continually grapple with such questions as: How do you protect the efficiency generated by a market-oriented agriculture, while avoiding or limiting excessive variability and risk? How much variability is too much in an increasingly risky environment? What is the appropriate public/private sharing of risk? How can consistency among policies be achieved? ERS research can help to answer these questions and lay the foundation for improved policymaking in the 1980's and 1990's.

RESEARCH EMPHASES FOR THE REST OF THE DECADE

Areas of future emphases by the agency are discussed below. For most topics, research is underway. The topics are not listed in order of priority; each is important. Further, the areas to be emphasized are highly interrelated. The agency expects significant accomplishments in each area within the existing base program. During the balance of the decade, ERS may also seek resources to carry out priority work related to these areas of emphasis, work that cannot be done within the existing program. Also, the agency will seek arrangements with university cooperators to undertake work of mutual interest, and thereby extend the use of present resources.

Macroeconomic Developments and Agriculture

Changes in world economic conditions, the shift to flexible exchange rates, the development of the European common market and global capital markets, and a resurgence of monetary approaches to macro policy have exerted significant impacts upon agricultural commodity markets and price volatility, domestic and international agricultural economies, and agricultural trade. Also, domestic macroeconomic factors can affect agribusiness suppliers, producers, and marketing firms by changing the availability and cost of key inputs ranging from labor to steel to credit and finance. National and global macroeconomic relationships may have more future impact than farm programs on the level and variability of farmers' income.

The United States has traditionally used a range of policies to influence the growth of the money supply, stimulate the domestic economy, influence interest rates, reduce unemployment, and adjust other key macroeconomic factors. Similar devices are used by other governments. Macroeconomic policies are frequently determined outside the agricultural sector. However, as a result of macroeconomic events, which cannot necessarily be predicted with accuracy, the agricultural sector must make adjustments.

Until recent years, the agricultural sector was thought to operate largely independently of macroeconomic events. This is no longer the case, given the greater reliance on export markets and the increasing importance of the linkages between the rest of the economy and agriculture. Little research has been done on the linkages. Little information is available on how expected developments in monetary and fiscal policy, for example, are likely to affect returns to producers. The principal issue concerns the appropriate policy action for agriculture to ameliorate the negative effects of macroeconomic developments.

Future emphases: In response to these needs, ERS plans to expand and improve its situation and outlook information and policy research relating to macroeconomic and aggregate agricultural sector linkages. This will include developing an improved data base and monitoring more closely the macroeconomic indicators such as interest rates, employment and labor force participation, capital flows and formation, international debt, exchange rates, government fiscal and monetary policies, Federal deficits, and activities of organizations such as the International Monetary Fund. The agency will rely on other Government agencies, such as the Department of Commerce, as well as private firms to provide forecasts of

many of these major macroeconomic variables. ERS analysts, in turn, will develop annual series of macroeconomic indicators and trace the implications of these factors for the U.S. agricultural and related sectors, agricultural exports, and selected international economic variables.

The following research will be emphasized:

- Studies examining the relationships between macroeconomic factors such as GNP, national income growth, foreign exchange rates, or interest rates on the mix and level of U.S. trade with foreign countries.
- Analyses of impacts of inflation, interest rates, and other macroeconomic variables on the production of agricultural commodities among the producing regions of the United States and in the rest of the world.
- Research on the effectiveness of alternative U.S. agricultural income support and farm credit policies in relating to macroeconomic variables, with special emphasis on policy alternatives that will provide flexibility for policymakers to adjust to changing international and domestic macroeconomic conditions.
- Evaluations of alternative international lending policies, the role of export credits, and the impact of some countries' heavy international debt obligations upon aggregate demand for U.S. agricultural exports.

Competitiveness of U.S. Agriculture in World Markets

The United States is still competitive in world markets for most of its agricultural exports, but its future competitive position and comparative advantage is in question. Comparative advantage is a dynamic concept. Comparative advantage is affected by investments in human resources and in research and development of technology, as well as by natural resource investments, policy, and marketing and transportation investments. From a domestic perspective, the issue concerns the ability of the United States to make appropriate investments to maintain and enhance the competitiveness of its agricultural products in world markets. A related issue concerns the ability of the United States to be competitive in exporting value-added agricultural products. From a global point of view, the critical issue is whether the world's agricultural resources are being developed and used in the most efficient manner; that is, whether food and agricultural supplies are being produced at least cost.

These issues raise significant questions, among them: Would increased trade be accompanied by lower real prices? What are the main factors that will affect the U.S. competitive position? For which commodities does the United States have a comparative advantage in production? Will

emerging technologies such as genetic engineering and other developments in biotechnology favor U.S. agriculture in the short and long term? Can markets for agricultural products be expanded and new markets created through cost-reducing technology?

Future emphases: As part of the trade competition work, ERS will improve and expand its foreign country data and information on the technical, economic, and institutional variables that affect costs of production, comparative advantage, and competitiveness. These data will permit improved longrun projections of world supply and trade of agricultural commodities. New data include information on the basic resource endowment and capital used in agriculture; the nature and magnitude of investments in agricultural research, extension, education, and technology; the physical facilities for food production and marketing; and data on prices for agricultural goods.

ERS's plans encompass the following major research:

- Studies of the competitiveness of agricultural production and trade by the United States with other major producing or consuming countries, including analyses of the reasons for changes in patterns and composition of agricultural trade and market shares.
- Assessments of the kinds and magnitudes of investments, including research and development of new technologies, in the agricultural sector and their effects on cost of production, comparative advantage, and competitiveness, both domestically and in the world.
- Investigations of the price responsiveness of production and consumption in foreign countries to aid in estimating supply and demand elasticities for major commodities in major countries and regions as well as in estimating import demand and export supply elasticities.
- Evaluations of gains and losses arising from alternate trade policies, including measures of changes in the competitiveness of the United States in comparison with trading partners.

Resource Use, Production Efficiency, and Supply Response

Agricultural supply response in the late 1970's demonstrated that farm production can be expanded rapidly, through both increased use of inputs per acre and the addition of cropland. Farmers returned much cropland to production. Even though yields continued to increase, less productive, more fragile lands were cultivated. Pastureland acreage decreased; fewer forage resources were available for animal agriculture.

Production efficiency and increasing productivity continue to be the hallmark of U.S. agriculture. At prevailing price-cost relationships, adequate supplies are forthcoming to satisfy domestic markets and a sizable share of world markets. However, there is a continuing need for the agricultural producing sector to become more efficient. Improved productivity will increase societal well-being, and lower costs will permit U.S. agriculture to be more competitive in world markets.

The underlying public issue is the future ability of U.S. agriculture to adjust production to serve domestic and international markets as well as food aid needs, within an environment of price-cost relationships that permit satisfactory farm income. This issue suggests several research questions: What combination of intensive production practices and land use patterns will reflect the long-term national interest? Can increased production levels be sustained? At what point do energy prices become a constraint? Will raw material resources permit the continued supply of low-cost inorganic inputs such as pesticides and fertilizers? What factors will affect production efficiency and supply response? Can agriculture continue to produce and compete at lower real prices? Should ground water supplies that do not replenish be used or conserved?

Future emphases: In response to these continuing concerns, ERS will improve its situation and outlook and projections information concerning supply response by publishing annual State and national estimates of agricultural land use, and by providing detailed information every 5 years on the dynamics of land use and conversion costs and on irrigation water use management and development. ERS will also monitor the demand and supply of hired farm labor and publish quarterly information concerning the supply, demand, and use of energy, fertilizer, pesticides, farm machinery, and other manufactured inputs used in agricultural production processing and marketing. Detailed information on pesticides and other inputs will be obtained, by commodity, at least every 5 years. ERS will publish annual series on productivity changes including crop losses due to pests and other natural causes and productivity loss due to soil erosion, and will prepare periodic intermediate-term projections of resource use, inputs, and productivity.

For this expanded program, four major surveys will be used to obtain data: (1) cost of production farm expenditure data on production inputs and related farm and enterprise management practices; (2) economic information on land and water use and management, soil management systems, long-term productivity, water use efficiency, energy conservation, and range management; (3) data on pesticides, fertilizer, energy, labor,

and other inputs used by major crops and livestock; and (4) information on family and hired labor.

Also, ERS will emphasize the following research:

- Evaluations of the changing relationship of capital credit, labor, and management to agricultural productivity along with examination of credit, labor, and immigration policies relating to production efficiency and supply response.
- Studies of the relationship of soil erosion to productivity, including analyses of policy and program options dealing with soil conservation.
- Analyses of the efficient use of irrigation water, water conservation, and water development, including the examination of options available to Federal and State Governments to improve the pricing of water and the equitable distribution of development costs.
- Investigations of the continued effectiveness of manufactured inputs to increase productivity or protect against loss of productivity, including measurement of input relationships and substitutability, examination of proposed regulations or incentives to change the use of certain practices, and changes in inputs given alternative prices of inputs and commodities.

Agricultural Production and Income Variability

In the past two decades, farming increasingly has involved higher levels of technology and has become capital intensive, with capital investment per farm rising more than 800 percent and total outstanding debt increasing over 700 percent. The income-to-debt ratio has fallen 77 percent during the same period. The effect has been to increase the economic vulnerability and financial stress of farm operations during periods of economic adversity. U.S. agriculture has simultaneously grown more dependent on domestic and international macroeconomic developments, and weather patterns continue to be a source of variation in production. These factors have the effect of making the income of U.S. farmers subject to a wide variety of supply, demand, and political forces, increasing the financial risk of farming.

Excessive production risks and income variability will limit investments in agriculture; farming will attract fewer new entrants. On the other hand, agricultural land values have been influenced by speculative purchasers to capture capital gains. If agriculture is to remain competitive in world markets and provide low-cost food supplies to U.S. consumers, effective strategies to moderate the effects of price and income variability and speculative land purchases may be needed.

The level and variability of farmers' income is a public issue that will continue to face agricultural policymakers. Does a high-technology agriculture make production more variable? What are the principal sources of variability and what are the implications for the level, variability, and distribution of income of producers and food and fiber costs for consumers? Should special consideration be given farmers with relatively high credit requirements and limited resources, and those who wish to gain entry into agriculture? Should speculative land purchasers receive program benefits? Should programs provide income support to assure against extremely low revenue years? Should the goals of agricultural policy include income maintenance and if so, who should receive the income and at what levels? What is the rationale for support of the farm sector opposed to other sectors of the economy, including agribusiness groups such as input suppliers, processors, and distributors? What is the role of commodity futures markets in reducing income variability?

Future emphases: To be responsive to these issues, ERS will strengthen situation and outlook information on farm income, costs, and expenditures, as well as perform analyses to support public policy information needs. This activity includes continuing to publish annual estimates of costs and returns for major commodities by enterprise type and geographic location, and publish information on levels of other farm-related income and off-farm income, by type of farm wage earner. National balance sheet information for agriculture will be provided, including annual statistics for major sales class distributions; estimates of balance sheet assets, debts, and equity of the farm sector, capital gains, and capital flows; and forecasts of the major components of the balance sheet and aggregate farm income accounts. ERS also plans to combine current major surveys of costs of production and farm expenditures to minimize survey costs and provide information on regional and national costs of production for commodities by farm size, type, and region. New surveys will be initiated to improve the accuracy, timeliness, and State-level reliability of the existing farmland value series.

ERS will emphasize the following research relating to issues influencing agricultural income levels and variability:

- Research on the effects of technology on agricultural production levels and variability including evaluation of public policies and programs to minimize technology-induced risks.
- Studies of the relationship of input subsidies through government programs and regulations on the level and variability of agricultural income including agricultural credit, tax policy, alien labor, erosion control, and natural resource development.

- Analyses of the effects of alternative commodity price support programs on agricultural income levels and variability, government expenditures, and consumer costs; that is, evaluation of policy options that provide flexibility in support mechanisms consistent with world market-clearing levels.
- Examine the relationships between farm income, commodity stockholding, futures markets, domestic food security, and trade, and evaluate the effectiveness of alternate policies relating to stockholding on food security in achieving farm policy objectives.

Structure and Performance of the Agricultural Production Sector

The number of farms in the United States declined from a high of 6.5 million in 1935 to 2.2 million in 1982. Farmers produce 3.4 times more per work hour than in 1960 and over 14 times as much as in 1930. Changing structure and productivity of the producing sector can affect farm operators' families, resource owners, input suppliers, product handlers, consumers, and taxpayers. Similarly, the structure of the input and marketing functions can influence the intersectional distribution of income between farming and these functions. Such issues as tenure of farm operators and returns to factors—land, capital, labor, and management including the distribution of returns among these factors—become crucial.

For the farmer, questions of market access, equity and efficiency of pricing arrangements, and institutional arrangements such as cooperatives and market orders become important. The price of food to consumers and the costs of agricultural policies to taxpayers may be affected by the changing structure of agriculture or by policies to alter these changes.

Research has yielded mixed results with respect to the possible linkages between Government policies, programs, and institutions and the structure and performance of the farm sector. Nevertheless, many believe these programs are strong determinants of the number, size, wealth, and ownership distributions in the farm sector.

The primary issue concerns how the performance of the agricultural sector will be affected by current structural, technological, and economic trends; increasing concentration of production; new technology and productivity gains; greater reliance on debt financing; more separation of ownership from operation of farms; incentives provided under Government programs and regulations; and the proliferation of noncommercial hobby,

resident, or part-time farms. Will an agricultural sector of part-time, small- and medium-sized producers dominated by highly concentrated commercial farms continue to increase in efficiency and effectiveness? Will the farm sector, buffeted by instability of prices, yields, and incomes, become less productive or resilient? Will the resulting food prices to consumers be higher or more volatile, or will the real price of food continue to decline? Will the farm sector continue to adopt technological advances, improve productivity, and help raise the standard of living for Americans?

Future emphases: In response to these concerns, ERS will improve the outlook information on structural change and the economic performance of the agricultural sector. Information will be released periodically that assesses the well-being of farm operator families including farm and off-farm income, cash and credit position, capital gains, wealth accumulation, tax liabilities, risk exposure, policy and program participation, and program costs and benefits. Productivity and efficiency indicators of the farm sector for States, regions, and the Nation will be provided annually. Other qualitative and quantitative measures of production, marketing coordination, pricing performance and pricing efficiency, and impacts of agricultural policies on commodity subsectors and markets will be expanded.

Research areas to be emphasized include:

- Analyses of the linkages between structure and the efficiency of production, input supplies, and marketing in the agricultural sector with emphasis on the economic strengths and weaknesses of farms and firms of various sizes, types, and financial situations. Emphasis will be on trade-offs that exist between desired technological advances and unintended structural change.
- Investigations of the consequences of the separation of farmland ownership (including ownership by absentee and foreign investors) and operating control of farmland on future farm structure and performance including credit sources, equity ownership, intergenerational transfers of farm assets, and the distribution of benefits of agricultural programs.
- Evaluations of the effects of Government policy alternatives on structural change and performance in agriculture in the short and long run with emphasis on adjustment assistance programs, foreign investment regulations, tax and credit policy, and commercial agriculture policies with payment limitations or provisions designed to aid target groups such as new farmers, small farmers, and resource developers.
- Evaluations of the consequences of structural change and adjustments in agriculture on rural communities and the Nation as a whole. These

studies will focus in particular on the role of public policies in controlling structural change: the rationale, effectiveness, and side effects.

Conduct and Performance of the Agricultural Marketing Sector

Two-thirds of each dollar spent on food goes to pay for marketing functions. This share likely will increase as more services continue to be incorporated into the final product. The structural characteristics of the food processing, marketing, and distribution industries are dynamic in response to economic pressures and the regulatory environment. New Federal policies regarding regulation and interpretation of antitrust regulations, combined with recent economic stress, are creating a high degree of merger, divestiture, and consolidation activity among firms involved in food marketing. At the same time, the rapid development of high-technology applications is affecting the way firms operate and their cost structures. The electronic checkout scanner in food retailing is just one example.

Today's structural changes will affect the food industry for a long time. Knowledge of how the food-marketing sector performs is critical to our understanding of the linkages in the food-marketing chain. The characteristics of changes within and across functional levels in the marketing system carry important implications for price discovery, pricing efficiency, market access, product quality, and product mix at the consumer level. The producing sector also is affected. Will wider margins make producer adjustments more difficult? What factors in the marketing chain are least efficient? Does technological innovation lead to increased concentration? Will deregulation in the transportation industry increase producer marketing options? Are all producing regions served with market outlets?

Future emphases: To fulfill the needs in this area, ERS plans to expand and improve the dissemination of data relating to food-marketing costs. In particular, more information will be provided on major marketing input use and costs. Emphasis will be on disaggregating the series as much as possible by industry and geographic area for cases where input markets are not homogenous. Transportation rate coverage will be expanded and the availability and utilization of rail, truck, and ocean services will be monitored. Information will be developed on input productivity within various marketing subsectors. Food marketing productivity indices will be developed along the lines of the recent decision by the Bureau of Labor Statistics (BLS) to publish three measures of productivity: index of labor productivity, a new index of capital input

productivity, and a new index of multifactor productivity. In addition, ERS will expand the situation and outlook activities relating to farm to retail price spreads, food marketing costs, margins, and prices.

Research efforts will be emphasized as follows:

- Investigations of the structure, conduct, and performance of the food processing, marketing, distribution, and retailing sectors, including determination of the effects on market entry, market efficiency, price discovery, and competitiveness for selected food commodities and products.
- Research designed to quantify and define the structural characteristics of inputs of a noncommodity or nonfood nature in the marketing sector. These include labor, energy, packaging materials, and capital, plus analyses of the relationships between these inputs and the structure of agricultural markets.
- Analyses of emerging food manufacturing and marketing technology, and Government policy and regulatory actions on costs, profit margins, location, and productivity of the food industry.
- Studies of the effects of the deregulation of the rail and trucking industries on shipping patterns, market access, and transportation costs; emphasis will also be on the effects of deregulation on marketing margins and the location of production.

Commodity Demand and Food Consumption

Food consumption patterns are expected to continue changing. These patterns reflect sociological, demographic, and psychological forces as well as the effects of price and income stimuli. Thus, changes in consumer preferences and in consumer purchase decisions are closely tied to the dynamic characteristics of the U.S. society in general and to the economics of both agriculture and the general economy. Although the U.S. agricultural sector has become increasingly dependent on foreign markets, many subsectors within agriculture continue to depend almost entirely on domestic markets. These include livestock, fruits and vegetables, dairy, and poultry. Industrial demands for agricultural products are expected to emerge. Efficient resource allocation within and between these subsectors depends, to a significant degree, on adequate recognition and anticipation of changing consumption behavior and possible industrial uses.

Many changes that might affect commodity demand are relatively new. Recent volatility in interest rates, nutritional concerns, and general economic activity have influenced consumer budget decisions. How

consumers adjust food consumption patterns to these stresses is of vital concern to agriculture producers. Livestock producers, for example, closely monitor consumer preference for red meat. Will the trend toward more away-from-home food consumption continue and, if so, what are the implications for consumer choices among food products? How do Government policies and programs for agriculture and food assistance affect food prices and consumption behavior? What is the potential effect of nutritional guidelines on product demand? How much does product promotion by commodity groups shape consumer demand behavior? What are the costs to producers and consumers of food protection and safety regulations? What industrial demands likely will compete with food demands for agricultural commodities?

Future emphases: In response to the commodity demand issue, ERS plans to expand the situation and outlook information base on food demand with emphasis on additional coverage of away-from-home food expenditures, more disaggregation of food expenditures, consumption, and prices by commodity group, and on marketing input prices which affect marketing margins and consumer food prices. Included will be market penetration analyses of existing and prospective industrial demands for agricultural commodities.

Research in this area will emphasize:

- Studies which identify factors affecting the decision to consume food away from home and to quantify the relationships between changes in these factors and food group consumption levels. Inherent in these studies is research on factors affecting food service firm decisions on food purchase and the impact on consumer consumption levels.
- Analyses of food assistance programs including research on the determinants of food consumption behavior within specific target groups and the implications for program participation.
- Evaluations of the costs and benefits to producers, consumers, exporters, and other industry groups resulting from Federal grades and standards for fresh and processed food. This includes studies of the effects of nutritional and content labeling, the demand implications of nutritional guidelines, and the impact on consumption patterns of increased awareness of health controversies over various foods and their attributes.
- Cost-benefit analyses of food safety and quality policies with emphasis on the tradeoffs between food standards and food safety and costs to producers and consumers of food protection regulations.

Agricultural Trade and Price Variability

Many countries protect their farmers from price variability in international commodity markets. Agricultural price and income support programs often result in supply conditions that require the imposition of import barriers, export subsidies, production controls, stocking programs, or some combination of these to balance quantities produced and used. These policies result in more variable world market prices for agricultural products. As a result, U.S. farmers with big stakes in export outlets face highly variable returns.

Agricultural trade patterns are influenced by import barriers, export subsidies, production controls, stocks management, and related trade policies. To what extent do these policies restrict the pursuit of comparative advantage? What U.S. farm trade strategies will minimize the effect of the various trade policies of other countries? Will a domestic stocks policy provide a sufficient buffer against shocks in trade patterns? Which sector of the economy, and who among the trading partners, should bear the costs of programs to promote trade stability?

The issue raised by policy-induced world price variability is how and by whom shall costs of adjusting to instability be borne and what measures will be most effective in moderating the fluctuations in agricultural prices and supplies. Public policies and programs in the United States may need to be altered and new ones devised to deal with trade problems. Stocks management will be an important component of policies to deal with instability. But these and other issues must be dealt with by domestic commodity and trade policies as well.

Future emphases: ERS will monitor the global conditions that give rise to price variability—weather, domestic policies, world stock levels, trade barriers, trade agreements, and such—and improve its capacity to analyze and forecast developments in world agricultural supply, demand, and trade.

ERS will focus on:

- Analyses of the relationships between price instability and stockholding policies and programs in the United States and other countries, especially the major producing, consuming, and trading countries. Included here will be analyses of domestic and trade policy and program options related to stocks for dealing with the issue of variability.

- Research on the linkage between price variability in international commodity markets and the commodity policies and programs of U.S. agriculture. These analyses will include the examination of alternative commodity program options for dealing with international shocks to domestic price levels from whatever source.
- Investigations of the relationships between agricultural and trade policies of the major exporting and importing countries, including description of the agricultural and trade policies employed, and estimates of the government, consumer, and producer costs and benefits that result from the linkages between these policy sets. Also included will be studies of bilateral trade agreements as both a source of and solution to the problem of variability in international commodity markets.
- Analyses of the effects of reductions in trade barriers, including nontariff as well as tariff distortions, on the stability of commodity markets. Included will be assessments of the policy behavior of centrally planned and developing countries who rely upon state trading as opposed to market mechanisms in making import and export decisions.

International Agricultural Development, Trade, and Food Security

The United States has humanitarian as well as broad economic and trade interests in developing countries, which still have problems of low income, inadequate consumption, little food security, and lack of purchasing power in international markets. The stability of the world depends to a large extent on the growth and well-being of developing countries. The principal issue concerns how the developed world, and the United States in particular, can help as well as benefit through third world development. How these countries grow economically, develop their agriculture and meet their food needs will have significant impacts on world and U.S. trade in agricultural commodities. Should developing countries strive for self-sufficiency in food production? What trade patterns are in their long-term interests? What is the role of food aid and international credit policies in international development? What food security strategies are in the interest of developing nations and U.S. farmers? What are the benefits and costs to American agriculture of U.S. programs to aid in the improvement of agriculture in those nations?

Future emphases: As part of its situation and outlook program, ERS will develop and maintain data series to monitor agricultural development, economic growth, and market development in the low- and middle-income countries. Further, ERS will improve its capacity to analyze and forecast the near- and medium-term prospects for U.S. agricultural exports to

developing country markets and will enhance its capability to forecast the food aid needs of the neediest developing countries. The enhanced food and agricultural information system will be available for use in food aid and agricultural development policy implementation.

ERS will emphasize:

- Studies of the relationship between agricultural development and the growth and composition of trade with emphasis on complementarities between U.S. and developing country agricultural production and trade. Included will be assessments of the impact of different patterns of growth and development on agricultural trade.
- Analyses of the prospects for economic growth, agricultural development, and food production in major developing regions including investigation of the effects of food aid both on commercial trade and on the process of agricultural and economic development.
- Studies of alternative means—production, stocks, trade—of meeting world food security objectives of assuring adequate food supplies at a reasonable cost for low- and middle-income countries. The implications of alternative approaches to food security on U.S. agricultural trade will also be examined.
- Assessments of the potential demand for agricultural commodities in individual developing countries including food needs and the growth of agricultural production in the newly industrializing countries. These assessments will be updated periodically as economic conditions in the countries concerned change.

Effects of Technological Change

Understanding the development and adoption of new agricultural and related technologies, both domestically and internationally, is central to analysis of supply and demand relationships in the foreseeable future. The adoption of technology has been crucial to gaining U.S. competitive advantages in international markets. These developments have also steadily reduced the labor, land, water, and energy inputs per unit of crop and livestock output. Farm size and organization and regional production patterns have been radically altered. The emerging technologies suggest continued human capital development needs at both the farm and higher education levels.

Two emerging technologies expected to have major impacts on agriculture and related sectors are genetic engineering and the use of the electronic media in farm production and marketing decisions. Reliable

information is needed on the economic and social consequences of these and other technological changes, both to guide public and private research managers on program planning and to advise policymakers on actions to facilitate changes or ameliorate the adverse effects of changes.

The use of public funds for the development of new agricultural technologies involves two issues: (1) the type and mix of research and development to optimize the social rate of return to such investments, and (2) externalities associated with technological change. Since new agricultural technology is both a necessity and a reality, the primary question concerns the research and development strategy that insures the continued development of appropriate technology for agriculture consistent with society's goals. What prominent emerging technologies offer opportunities to enhance agricultural production and marketing? What are the potential intersector and interregional effects of these developments? How will production patterns, labor needs, capital requirements, farm organization, and marketing systems change? What is the relationship of research and development expenditures to productivity changes? What lines of technology development would appear to be beneficial to the longrun interest of agriculture and society?

Future emphases: ERS plans to monitor and analyze the implications of the development and the adoption of technologies concerning their potential impacts on agricultural supply and demand. As part of this focus, ERS will monitor and analyze information on input use and substitution potential at the national and regional level and will maintain files on emerging technologies relating to agricultural production and marketing and resource use. A series of market penetration studies will be developed on prominent emerging technologies such as photosynthetic enhancement, nitrogen fixation, genetic engineering, and high efficiency pesticides.

Technology-related research will receive the following emphasis:

- Analyses of electronic information dissemination and advanced computer capabilities on the efficiency of farm production and marketing, including effects on the rate of adoption and diffusion of technological advances, the enhancement of managerial competency and span of control, and the minimization of weather, disease, price, and other production or marketing risks.
- Studies of the productivity of research expenditures for technology development, including the construction of a conceptual and analytical framework to guide USDA science and education managers on the

appropriate levels, mix, and timing of research expenditures. Included will be studies of institutional alternatives to manage agricultural technology advances, and studies of the interactions between private and public research and development activities.

- Evaluations of the secondary effects of new technologies—including effects on regional location of production, labor needs, capital requirements, farm organization, and marketing systems—for determining the potential effectiveness of policy and program options and research strategies.
- Research on technology related to new agricultural product manufacturing and processing, technology which could alter marketing patterns, consumption, and the structure of the marketing sector. Included would be research on the community-level commercial impacts of technological change in agricultural production practices with particular emphasis on the ability of and impacts on local economies in coping with the new technology.

Environmental Impacts on and from Agriculture

Agricultural production may be adversely affected by environmental pollution from outside agriculture. In turn, agricultural production and marketing activities may cause unintended environmental degradation and/or hazards to human health as the food and fiber system deals with new and old biological pests. Heightened environmental concerns stem from intensified public awareness of environmental pollution effects.

There has been an increased awareness and change in public values and expectations concerning the environment. Appreciation for natural esthetic values has intensified. Concern about health risks has increased. Scientific capability to measure minute amounts of potential contaminants has improved. Calls for return to wilderness purity or risk-free health conditions, though, are often innocently unaware of the staggering costs that would be needed to achieve complete purity or zero risk. Society is now asking tough questions about the degrees of risk and levels of purity which realistically can be obtained. What are the economic impacts of air and water pollutants on agriculture? What are the off-site damages attributable to erosion of agricultural lands? What are the economic tradeoffs among producers, consumers, and taxpayers of alternate policies to protect the environment? What combination of production practices will best serve the mutual interests of producers and consumers of agricultural products?

The public challenge is to facilitate wise and timely decisions on health effects, based on assessments of public values, economic and social

tradeoffs, and certain unquantifiable risks. Economic analysis can contribute to better decisions through estimation of the benefits and costs of alternative regulatory and other actions. Economic information regarding the risks and probabilities in a situation will help further public awareness of the necessary tradeoffs involved.

Future emphases: ERS will expand its program to monitor indicators of environmental quality, including airborne pollutant concentrations in rural areas, soil salinity, sedimentation rates, water quality degradation, and the use of agricultural chemicals that may be harmful to the environment. ERS collects only limited primary data relating to these factors but does periodically review and summarize data released by other agencies linking environmental quality to agriculture.

ERS will emphasize the following work:

- Investigations of the economic impacts of gaseous air pollutants and acid rain on farms, forests, and recreation activities, in order to evaluate alternate policy measures to reduce or control pollutant and acidity levels, or mitigate their effects.
- Analyses of the benefits and costs of alternative measures to alleviate surface and ground water pollution originating from agricultural activities, to aid public decisions regarding environmental policy.
- Publish reports on the cost-effectiveness of alternative pest control measures for major food and fiber crops, including analyses of pest management strategies least harmful to the environment.
- Appraisals of off-site damages attributable to erosion and estimates of benefits from control measures. This information will assist program agencies in developing and implementing equitable and efficient programs relating to rural clean water.

Rural Employment and Economic Growth

The continued growth and viability of rural America depends in large part on how well the rural economy performs in competition for additional economic opportunities. The extent to which this competition among regions benefits the national economy and society, or whether one region's gain is necessarily another region's loss, is an important policy question for the 1980's. The public issue concerns rural America's ability to provide equitably the residential and employment opportunities needed by rural citizens, contribute to balanced national growth, and be a vital force in the Nation's society and economy.

Despite renewed demographic and economic vitality in much of rural America, numerous areas and population groups have been bypassed by rural growth. Almost all of the Nation's poorest counties are rural, and most have been persistently poor for at least 30 years. And, rural poverty falls disproportionately on minorities and the elderly, and is associated with low educational attainment, few marketable work skills, poor health, work-limiting disability, and chronic underinvestment in community resources. Hence, the proper targeting of public action to assist the poor is an important element in any strategy to create employment and encourage economic growth. What types and mixes of industry best fit the needs of rural areas? How is the growing integration of the U.S. economy into the world economy affecting rural economic growth prospects? What educational programs and retraining facilities are needed to help assure flexibility in the work force? What is the implication of immigration patterns on the nature and quality of the work force?

Future emphases: ERS plans to continue monitoring changes in the size and composition of the rural population and economy. Because these demographic and economic trends help judge how rural areas are faring, and may shape changes in policy, ERS will monitor trends in the size, growth, and household and socioeconomic makeup of the rural population and compare these trends to those of urban areas. Similarly, ERS will continue to document the transformation of the rural economy from its previous dependence on agricultural and extractive activities to its current dependence on manufacturing, services, and government employment. ERS will monitor the level and distribution of rural income, trends and components of income growth, and the incidence and geographic location of rural poverty. A report series on trends in the size and composition of the farm population will be continued with new attention given to alternative definitions and measurement strategies that will aid policy analysis.

Emphasis will be placed on the following research:

- Investigations of the linkage between agriculture and other industries in the rural economy as a whole, and in areas with differing levels of dependence on agriculture. The effects of alternative farm policies on the overall economy of rural communities will be studied, and conversely the effects of general economic policy on the viability of agriculture will be analyzed.
- Analyses of the relationship between changes in the size and industrial composition of the rural economy and the economic well-being of rural citizens. This includes studies of the distributional effects of rural

economic growth, such as, which population groups benefit from rural growth in terms of jobs and income.

- Studies of factors related to the growth and viability of rural business and industry with particular emphasis on linkages to the global and U.S. economies; Federal tax policy; the operation of capital markets; the geographic location of inputs and markets for outputs; labor quality, cost, and availability; and government programs to encourage economic growth will be included in the analysis.
- Evaluating the effects of levels of education, family composition, employment and occupation status, and demographic attributes (age, sex, race) on the level and distribution of income among rural areas, and between rural and urban areas, with particular attention given to persistently poor (and wealthy) areas. Similarly, the effects of these factors on income differences among rural people and households will be examined.

Rural Facilities, Services, and Housing

Three recent trends contribute to concerns that rural local governments may lack the fiscal, organizational, and managerial capacity to provide essential services and facilities to their citizens: (1) the growing rural population is older and is comprised of more and smaller households, (2) local rural governments are becoming more dependent on State and Federal aid, and (3) decisionmaking affecting rural areas is shifting more toward local areas of government. These trends, along with the projected fiscal austerity for all governments during the 1980's, suggest that the capacity of rural governments and other rural institutions to provide facilities and housing may be limited. The principal question concerns what strategy or strategies should be followed by rural communities to provide essential services and facilities for their citizens. How can these services and community facilities be financed? Can facilities be shared? And how can they be managed? What is the role of State and Federal agencies in providing adequate housing and community facilities?

Future emphases: ERS plans to expand its monitoring of rural government organization and functions with particular emphasis on the availability, adequacy, cost, and quality of facilities and services provided. Periodic reports will be prepared to describe the fiscal, leadership, and decisionmaking capacity of rural governments and of other rural institutions. Information will be reported on the quantity and quality of rural housing, on housing affordability, and on the availability and cost of credit to purchase rural housing.

ERS will emphasize:

- Investigations of the adequacy of rural housing in relationship to changes in the number and types of rural households, including studies of the economics of housing quality and analyses of housing affordability. The impact of alternate public programs on the rural housing market will be part of these studies.
- Analyses of the relationship between changes in rural population size and composition and the demand for and utilization of services and facilities, including evaluations of the role of public programs in the provision of needed services and community facilities.
- Studies of the relationships between the organizational and managerial structure and decisionmaking capacity of rural governments and other rural institutions and their ability to provide essential services and facilities.
- Research to explain the structure of the intergovernmental system with particular attention to the division of responsibilities among local, State, and national governments for financing and delivering services and facilities, including evaluation of alternative institutional arrangements.